

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

ACCESS ROAD (feet) CODE 560

DEFINITION

A travel-way for equipment and vehicles constructed as part of a conservation plan.

PURPOSE

To provide a fixed route for vehicular travel for resource activities involving the management of timber, livestock, agriculture, wildlife habitat, and other conservation enterprises while protecting the soil, water, fish, wildlife, and other adjacent natural resources.

CONDITIONS WHERE PRACTICE APPLIES

Where access is needed from a private or public road or highway to a land use enterprise or conservation measure, or where travel ways are needed in a planned land use area.

Access roads range from seasonal use roads, designed for low speed and rough driving conditions, to all-weather roads heavily used by the public and designed with safety as a high priority. Some roads are only constructed for a single purpose; i.e. control of forest fires, logging and forest management activities, access to remote recreation areas, or access for maintenance of facilities.

CRITERIA

Access roads shall be designed to serve the enterprise or planned use with the expected

vehicular or equipment traffic. The type of vehicle or equipment, speed, loads, soil, climatic, and other conditions under which vehicles and equipment are expected to operate need to be considered. Planned work shall comply with all federal, state and local laws and regulations.

Where general public use is anticipated, roads shall be designed to meet applicable federal, state and local criteria.

Location

Roads shall be located to serve the purpose intended, to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, to make the best use of topographic features, and to include scenic vistas where possible. The roads should generally follow natural contours and slopes to minimize disturbance of drainage patterns. *Cross slope roads can be utilized as a Diversion (Code 362) or Terrace (Code 600) and designed to meet these practice standards.*

Roads shall be located where they can be maintained and where water management problems are not created. To reduce potential pollution, roads shall be located away from watercourses and utilize buffers where possible to protect waterbodies.

Alignment

The gradient and horizontal alignment shall be adapted to the intensity of use, mode of travel, the type of equipment and load weights, and the level of development.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Grades normally should not exceed 10 percent except for short lengths. Maximum grades of 18 percent should only be exceeded if necessary for special uses such as logging roads, field access roads, fire protection roads or other roads not accessible for use by the general public.

For stream crossings, the road should be aligned so that it crosses perpendicular to the channel as much as possible.

Width

The minimum width of the roadbed is 14 ft for one-way traffic and 20 ft for two-way traffic. The roadbed width includes a tread-width of 10 feet for one-way traffic or 16 feet for two-way traffic. Each type of road also requires 2 feet of shoulder width on each side. Single-lane logging or special-purpose roads can have a minimum width of 10 feet, with greater widths at curves and turnouts. The two-way traffic width shall be increased approximately 4 feet for trailer traffic. The shoulder width may be either gravel or grass.

Turnouts shall be used on single lane roads where vehicles travel in both directions on a limited basis. Where turnouts are used, road width shall be increased to a minimum of 20 feet for a distance of at least 30 feet.

Side Slopes

All cuts and fills shall be designed to have stable slopes of a minimum of 2 horizontal to 1 vertical on heights of less than 4 feet. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted, if soil conditions warrant and special stabilization measures are installed.

Areas with geological conditions and soils subject to slides shall be avoided or treated to prevent slides.

Drainage

The type of drainage structure used will depend on the intended use and runoff

conditions. Culverts, bridges, fords, or grade dips for water management shall be provided at all natural drainageways. The capacity and design shall be consistent with sound engineering principles and shall be adequate for the class of vehicle, type of road, development, or use.

When a culvert or bridge is installed in a drainage way, its minimum capacity shall convey the design storm runoff without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types.

Table 1

Road Type	Storm Frequency
Forest Access Roads, Farm Field Access	2 year - 24 Hour
Farm Driveways, Recreation Facility Access Roads	10 year - 24 Hour
Public Access Roads, Camp grounds, Etc.	25 year - 24 Hour

An erosion-resistant low point or overflow area may be constructed across the access road to supplement culvert capacity on non-public use roads. Culverts, bridges, fords and hardened overflow areas should be installed so the road crossing does not significantly impact fish migration.

Roadside ditches shall be adequate to provide surface drainage for the roadway and deep enough, as needed to serve as outlets for subsurface drainage. At a minimum, the roadside ditch shall be 1.0 foot below the top of road surface to provide internal drainage. Ditch channels shall be designed to be on stable grades or protected with structures or linings for stability.

Intercepting dips, cross ditches, water breaks/bars may be used to control surface runoff on low-intensity use forest, ranch or similar roads.

Long stretches of up and downhill roads shall be broken up with intercepting dips, cross ditches, water breaks/bars or be crowned to remove rainfall runoff.

Intercepting dips are outsloped sections of road which act as water catchments and drainage channels. Length and depth must be adequate to provide drainage but not endanger traffic at normal speeds. The centerline or hydraulic bottom should be at an angle of 45 to 60 degrees with the centerline of the road. A minimum length of 50 feet on the uphill approach slope and 15 feet on the slope leaving the dip is necessary to minimize vehicle jolt and to prevent wheel tracks from channeling storm water down the roadway. The hydraulic bottom should have a grade about 2 percent more than the grade of the road. Intercepting dips are not recommended on roads above 10 percent grades. A raised shoulder or berm may be necessary to retain runoff water until it reaches the hydraulic bottom of the dip.

Cross ditches are small ditches shoveled at an angle across the tread, with the excavated earth piled along the downslope edge of the ditch.

On steep grades where runoff and erosion is anticipated down the road, water breaks/bars should be considered. Water breaks/bars are combinations of a broad shallow trench and low ridge built by bulldozer or grader for diverting runoff water from a road surface. Water breaks/bars must be constructed of materials that are compatible with the use and maintenance of the road surface. Water break/bar discharge areas shall be diversions, terraces, grassed waterways, gulches, or other stable outlets that are well vegetated or have other erosion resistant materials.

Intercepting dips, cross ditches, or water breaks shall be spaced so that storm runoff will be diverted off the road before it gains sufficient volume and velocity to cause

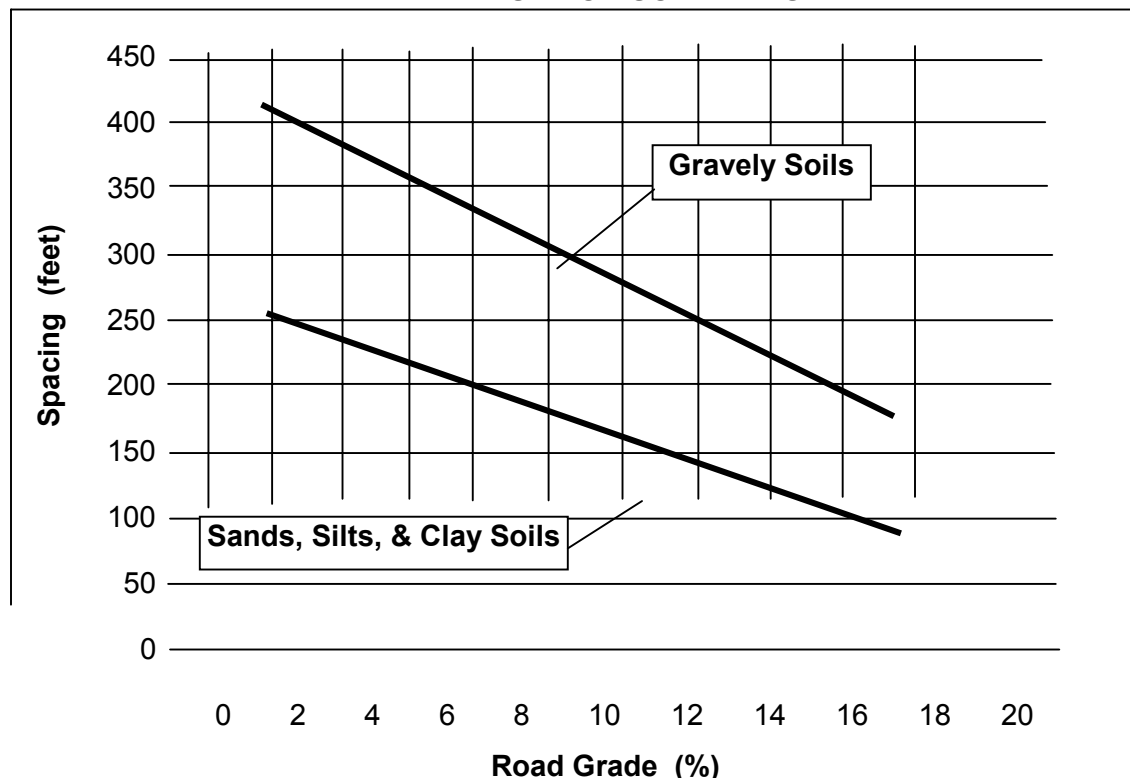
erosion damage to the road. The spacing shall be based on the design rainfall, area contributing runoff, roadway slope, and erosion resistance of the road material. See chart for Recommended Spacing of Relief Culverts and Water Breaks/Bars Based on Soil Type.

Surface crowning can also help direct road runoff into the side drainage ditches. Unobstructed flow into the ditches must be maintained to prevent flows from causing roadside erosion.

Provide a turnaround at the end of dead end roads. In some areas, turnarounds may also be desirable for stream, lake, recreation, or other access purposes.

Provide parking space as needed to keep vehicles off the road or from being parked in undesirable locations.

RECOMMENDED SPACING FOR RELIEF CULVERTS AND WATER BREAKS/BARS BASED ON SOIL TYPES



Surfacing

Access roads shall be given a wearing course or surface treatment if required by traffic needs, soil, climate, erosion control, or dust control. The type of treatment, if needed, depends on local conditions, available materials, and the existing road base. If these factors or the volume of traffic is not a problem, no special treatment of the surface is required.

On weak bearing capacity soils such as silts, organics, and clays, the surface treatment should be underlain with a geotextile material specifically designed for road stabilization applications when the road is used on a regular basis.

Unsurfaced roads may require controlled access to prevent damage or hazardous conditions during adverse climatic conditions.

Toxic and acid-forming materials shall not be used on roads. This should not be construed to prohibit use of chemicals for dust control after considering potential impacts on stabilizing vegetation.

Construction Operations

Construction operations should be carried out in such a manner that erosion and air and water pollution are minimized and held within legal limits. Construction shall include the following requirements as necessary for the job:

1. Trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area.

2. Unsuitable material shall be removed from the roadbed area.
3. Grading, sub-grade preparation, and compaction shall be done as needed.
4. Surfacing shall be done as needed.

Traffic Safety

Passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow shall be provided.

Traffic safety shall be a prime factor in selecting the angle and grade of the intersection with public highways. *Approval shall be obtained from the county or state for intersection with public highways. The angle of intersection and clear sight distance shall depend on the State Department of Transportation or county regulations.*

Preferably, the angles shall be not less than 85 degrees. The public highway shall be entered either at the top of a hill or far enough from the top or a curve to provide visibility and a safe sight distance. The clear sight distance to each side shall not be less than 300 feet or as required by local regulations.

Erosion Control

If soil and climatic conditions are favorable, roadbanks and disturbed areas shall be vegetated as soon as possible and skid trails, landings, logging, and similar roads shall be vegetated after harvesting or seasonal use is completed. See Hawaii Critical Area Planting standard (*Code 342*). If the use of vegetation is precluded and protection against erosion is needed, protection shall be provided by non-vegetative materials, such as gravel or other organic or inorganic material, or in accordance with local regulations. See Mulching (*Code 484*) standard.

Roadside channels, cross drains, and drainage structure inlets and outlets shall be designed to be stable. See Structure for

Water Control (*Code 587*). If protection is needed, riprap or other similar materials shall be used.

Watercourses and water quality shall be protected during and after construction by erosion-control facilities and maintenance. Filter Strip (*Code 393*), Water and Sediment Control Basin (*Code 638*), and other conservation practices shall be used and maintained as needed.

CONSIDERATIONS

Consider visual resources and environmental values during the planning and designing of the road system.

Access roads should be located where minimal adverse impacts will affect wetlands, waterbodies and wildlife habitat. Consideration should be given to the following:

- Effects on downstream flows or aquifers that would effect other water uses or users.
- Effects on the volume and timing of downstream flow to prohibit undesirable environmental, social, or economic effects.
- Short-term and construction-related effects of this practice on the quality of on-site downstream water courses.
- Overall effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances that would be carried by runoff from construction activities.
- Effects on wetlands and water-related wildlife habitats that would be associated with the practice.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing access roads shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Plans (design drawings) for access roads should specify the road:

- a. lengths,*
- b. width,*
- c. location*
- d. side slopes*
- e. culvert location*

f. water bar/breaks.

g. drainage structures

Any cuts or fills should be defined with sufficient grades and elevations. Dimensions and elevations of all drainage structures and culverts shall be shown on the plans.

All material requirements will be shown on the plans. If vegetation is included, the plans shall specify species, recommended planting method and fertilizer requirements.

OPERATION AND MAINTENANCE

The operation and maintenance guide for access road shall be provided to and reviewed with the landowner.